SUPPORT BY FIRE (PART FIVE) ATOMIC FIRES: THE BIG LIGHTNINGS
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SUPPORT

PART FIVE

ATOMIC FIRES: THE BIG LIGHTNING

BY FIRE

By LtCol T. N. Greene

"What we heard fired the imagination. Asfaw's patrol became a combat team riding armored into enemy country, too small and elusive to be a profitable atomic target, large enough to block and compel the enemy to extend his deployment. So doing, it would perforce make use of the most advantageous earth cover possible. Then, having developed the situation, from the vortex of action, it would call on the big lightning to strike all around. At no point would its force be any better than its nerve and its command of communications."

—BGen S.L.A. Marshall, *Pork Chop Hill*, Morrow, 1956

If and when the big lightning of atomic fire strikes the tactical battlefield, troop leaders will not be informed by an umpire handing them a chit. Argument will cease on the nature of limited wars and the question of all commanders about nuclear support will be the same as for any other supporting arm: What will it do for me, how soon, and how do I get it?

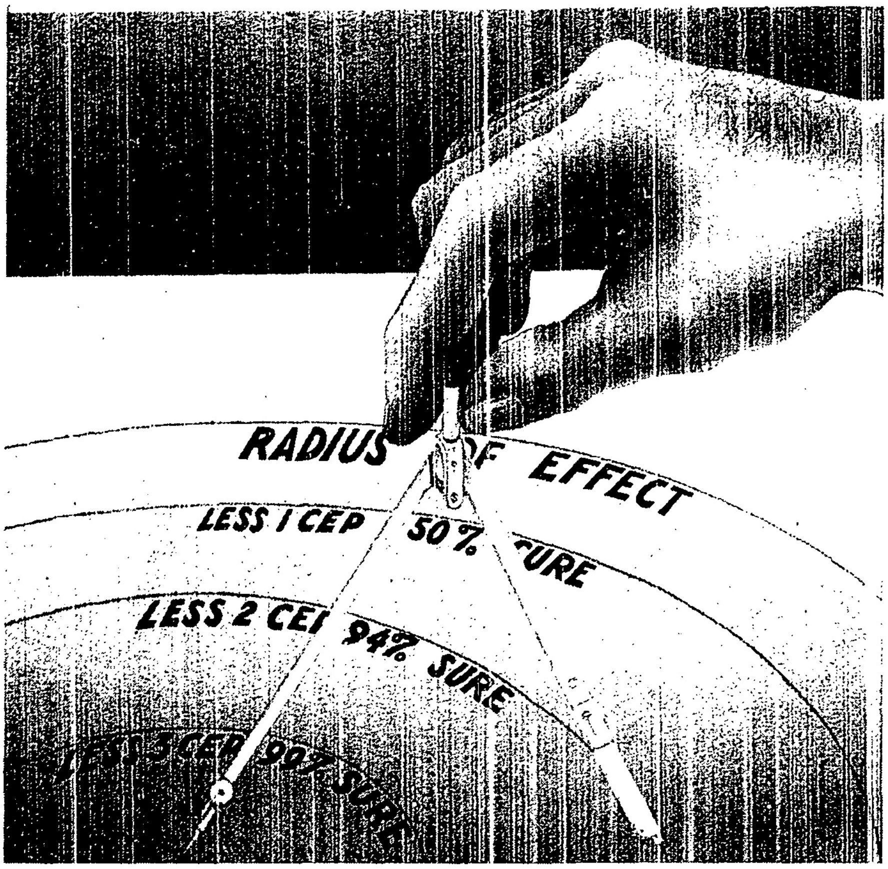
Daily it becomes more possible to foresee employment of a Marine air-ground task force in a non-nuclear combat situation, a situation so familiar in the history of Marine Landing Forces, in which prompt, efficient and bold action stamps out a brush fire before it can spread. But between the two clear alternatives of nuclear war and conventional war lie truly limited wars—wars in which politics and strategy will place limits on actions of tactical commanders. Whether such tactical handcuffs will be defined in terms of miles or of kiloton sizes we cannot predict. Keeping strictly to the business of the professional Marine, we can categorize the practical possibilities for rules of the atomic game into four classes:

1) Operations in which atomic use is authorized and planned before D-Day.
2) Operations in which atomic use is not authorized before D-Day, but in which enemy capability for effective atomic employment is so strong that our delivery means will be loaded and locked.
3) Operations in which atomic use is not authorized and in which enemy capability for atomic employment is so weak as to recommend ready, but unloaded, weapons systems, with atomic weapons themselves kept just off the battlefield.
4) Operations in which the risk of atomic employment is considered remote.

Clearly, the first three situations call for full-scale atomic planning and training, both in the attack and defense. It is to these situations that the reorganized Fleet Marine Forces must direct their efforts. This article will be addressed to the perennial question of the troop commander: What will this weapon do, how fast can I get it, and how do I go about getting it when I need it?

We've had the atomic weapon for 14 years now and its main effects have been largely declassified. There should no longer be any real mystery about the primary results of an atomic detonation: blast, burn, immediate radiation and radioactive fallout.

The blast wave (overpressure) is a primary effect to be maximized in destroying buildings. Its effect against ground Marines is relatively slight; that is, to be close enough to be killed by blast, one of the other effects would probably get you first. For the aviation Marine, blast is a more serious matter, since enough pressure to destroy a jet in flight may extend several miles, even farther for helicopters. Blast may also be used to destroy military materiel. Mines can be crushed by the pressure, vehicles overturned and



By reducing a given radius of effect one, two or three CEP, the area of "sure" damage is shown graphically. For troop safety add three CEP.

"dragged" by the blast wave. In cities or woods, the damaging effects of blast may create a missile hazard for personnel.

The burning effect of an atomic detonation comes from the actual fireball. It can readily kill or disable personnel, but can be stopped or partly filtered by anything that would protect from the sun. Clothing offers protection, but can burst into flame at close ranges. A deep foxhole gives good protection against bursts at an angle. A tank, LVT, or overhead cover is required to protect from a burst overhead.

Immediate radiation is the new, and mysterious, effect. This seldom extends seriously much beyond the range of the burn. Normally, a man who survives in the open without blisters has nothing to fear from immediate radiation. At closer ranges, however, a man sheltered from burn by a foxhole or tank could receive radiation. Radiation can pass through a tank with only partial loss of effect. It can also pass through light earth or concrete cover, and some can enter a deep foxhole by reflecting off molecules in the air. Unless a man becomes sick within a few hours of the detonation, he has probably not received a lethal dose. If he does become sick, he may still survive.

The great misconception about atomic fires is that of fallout. Fallout occurs only when the weapon is burst on, or very close to, the ground. Much military use, particularly tactical use, will involve weapons burst in the air specifically to avoid the dangers of fallout. This general civilian misconception could be more readily erased from the minds of troops if in our exercises we would deemphasize the fall-out-bearing mushroom cloud of ground-detonated simulators. Even after a hostile burst, much protection can be gained by hitting the deck and covering bare skin surfaces, such as hands and face. It is the blinding flash of the atom, burst high in the sky, for which we must develop a conditioned reflex. One possible tool for field exercises is the photoflash cartridge, used for night aerial photography. In view of the amount of spectacular effects which can be observed being burst high in the air at any 4th of July fireworks display, it is truly remarkable that in 14 years we have not developed a realistic atomic simulator.

Any small-unit commander who is interested in realistic atomic training can rapidly get the "feel" of atomic effects by referring to the unclassified Department of Army Pamphlet 39-1. The effects of a weapon as to blast, burn, and radiation are circular from the point where the weapon bursts. The radius of effect varies with the so-called responsiveness of the target to a given effect. For example, command post tents would be blown down in a larger circle than one describing the area in which 5-ton trucks would be overturned. Personnel in foxholes would require a much closer burst than troops in the open. Such effects can be shown conveniently by a template, made up to show the size weapon, the height of burst, and the particular type of target. DAPam 39-1 presents such templates, in which similar types of targets are averaged so far as possible.

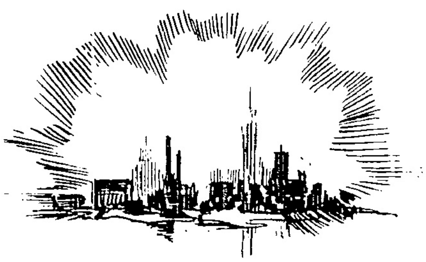
The fallacy of using atomic effects templates is that they show what happens when the burst is at a given point—Recommended Ground Zero (RGZ). However, since atomic fires are normally delivered by aircraft, artillery, rocket or missile, there remains the interesting question of where the round will actually hit—actual Ground Zero (GZ). This is handled by an experience factor called the Circular Error Probable (CEP). One CEP is defined as the radius of a circle in which one-half of all rounds, or bombs, will fall if an infinite number are fired, but excluding wild shots. The exclusion of wild shots, or gross errors, the difference between a range and a battlefield, and the obvious impractibility of firing an infinite number of rounds to determine a CEP are three factors that recommend a lingering doubt in relying on any quoted CEP. There is also the pertinent question of what happens to the other half of the rounds which do not fall within our magic circle. Approximately 94 per cent of all rounds fall within two CEP, and about 99 per cent within three CEP circles of the point of aim. To squeeze out that last one percent we must go to a circle with a radius of five CEP.

Using a CEP, then, a round is almost equally likely to fall outside or inside a circle drawn around our RGZ with a radius of one CEP. If we draw a two-CEP circle, we can be 94 per cent "sure" that the round will hit there. Thinking of troop safety, we are more likely to consider a three-CEP circle. DAPam 39-1 teaches the simple method of drawing such CEP circles around RGZ and then moving an appropriate template around to visualize what will happen. Since the error is circular—that is, it can be in any direction, this can be slightly confusing. A simpler method is to take a dime store compass used for drawing circles, adjust it to the radius of effect as shown on the template for the target you are studying and then reduce this radius by one, two or three CEP. You can then draw circles on the map around RGZ showing areas in which you are respectively 50, 94 or 99 percent "sure" of doing the damage shown on the template, with some "bonus" damage in an unknown direction. This method shows at a glance whether the combination of weapon size, height of burst, target, and expected delivery error is relatively sure of success.

To determine safety, however, use the reverse process and *add* three CEP to the safety radius shown; in other words, expect the error to occur in the worst possible direction, just as toast normally falls buttered side down. It should also be noted that only rockets among artillery weapons use the term CEP. As discussed above, CEP are determined by actual firing at a target and include all the small errors that are made by gunners, surveyors, meteorologists and pilots. The artillery term, Probable Error (PE), shown in firing tables, is not the same thing at all. It is the result of firings at a ballistics range which are carefully controlled to avoid all errors except the variations imposed by ballistics. If an artillery piece is registered accurately on RGZ, then PE would apply if the weather doesn't change too much. If it is not so registered, then some experience factor for error must be added in lieu of a CEP. Determination of an artillery CEP for various types of firing would be extremely useful not only for atomic, but for conventional fires.

So far discussion has been of general effects of atomic weapons and of quick methods to determine what effects could be accomplished in a given situation. The question of what atomic fires can do for a commander has not been answered. The obvious answer is that here, of all supporting arms, is a weapon which can destroy a target utterly. This is a point which atomic schools, training, and research have particularly stressed. Admittedly, the careful selection of one RGZ which will completely destroy three or more precisely located enemy targets without wasting one kiloton is as classical a maneuver as Cannae or crossing the "T". On the tactical exercise field, and presumably on the tactical battlefield, three strong limitations quickly rear their heads. These are lack of information, lack of time, and lack of room.

We cannot make precise analysis without precise information of the enemy, and this, to say the least, has



proved a problem. We cannot afford time for a long, precise analysis against a target rapidly moving to contact. Further, such lack of time may include the problem of considerable delay in switching from a ready weapon to one of the precise size required to do a neat job. The lack of room involves primarily troop safety. It is hard to atomize an enemy snuggled against your own perimeter. This lack of room also affects weapon size, since we may have to use a smaller weapon than desired, or aim a large one farther away.

The capability of the atomic weapon utterly to destroy an enemy target exists. On the strategic level, or even in deep support, it can and should be carefully exploited. In the smaller tactical picture, however, serious limitations are apparent. We can hope for improvement, but until such is guaranteed we must recognize the practical problems of lack of information, lack of time, and lack of room as limits to guaranteed destruction of targets.

Neutralization, the attack of men's minds to the point where they fail to fire their weapons, remains a real capability of atomics. As discussed in a previous article, guaranteed neutralization is exorbitantly expensive, if not impossible to achieve by conventional means. The "carpet-bombing" at St. Lô, although partially mis-aimed, is one example of success. It appears that true neutralization can be achieved by atomic fires. Consider the fringe areas of a burst—areas where 10 to 30 percent casualties occur. Here blast will usually blow down CP tents, situation maps, trees holding comm wire, and radio antennae. The fireball will temporarily blind most men, damage the eyes of some permanently, blister the skin of others. Tents, acetate on situation maps, and men's clothing may burst into flame. Under some conditions grass or forest fires will kindle. Radiation will remain the ominous unknown, the secret fear of all. Certainly, a few men showing symptoms of radiation sickness will do little to raise the morale of their units. An air burst will not cause fallout, but troop leaders may find this difficult to explain to men choking in clouds of dust raised from the surface by the shock wave and winds of high velocity. In fact, a recent article in *Military Review* proposed that the definition of atomic destruction be *at least 30 percent damage.*

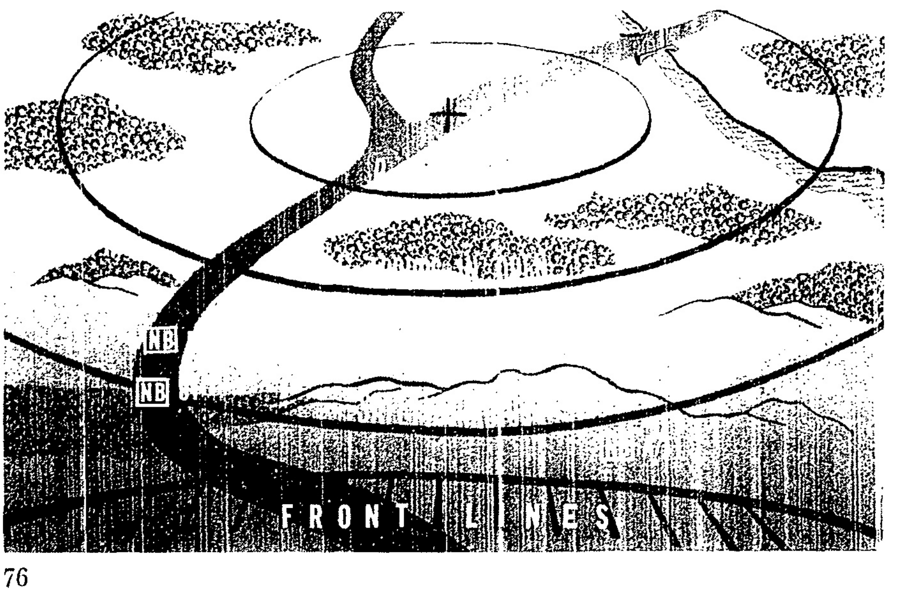
We do not know the point at which a unit becomes ineffective, but in WWII our enemies seldom persisted in an attack after suffering ten per cent immediate casualties. Atomic effects in the outer fringe areas tend to be random. One building may fall, another stand. One man can be burned, another shielded. How many men from a squad must fall instantaneously before the squad becomes ineffective? Small unit action reports show that sometimes one or two key men are the glue that holds that unit together.

For 14 years we have been trying to learn not to overestimate the atomic weapon. It is not all-powerful, not a checkmate to war. We must equally avoid underestimating its tremendous physical and psychological power. Certainly, we must train to build the understanding and

moral fibre that can withstand enemy use of this weapon. At the same time we must not fail to explore the possibility that this weapon can be more than a physical answer to human seas of illiterate peasants. It could be as potent a psychological factor as the gunpowder and horses of the Spaniards proved against the superstitious masses of the Incas and Aztecs. A very small weapon with physical power only to destroy a company could, under favorable circumstances, destroy a regiment or division as an effective fighting force by the power of fear. Such use could prove far more humane and more moral than any conventional war of history.

But to explore such a possibility, we must have the physical facts. We have too long concentrated on absolute destruction, guaranteed results. Let us have estimates as to how far away we can hope to destroy one man in ten, or two in ten. Let us have them even if they prove too optimistic. We cannot reduce the tactical battlefield to a precisely ordered annex of the laboratory. The use of atomic weapons on the tactical battlefield of the future, the exact results possible in the face of uncertainty, haste, and close quarters, can never be a science. It must remain an imponderable, one more of the mysteries for the solution of which commanders earn their pay.

The commander wants to know: How soon can I get atomic fire? If the problem were air or artillery, we would not start to answer by explaining the logistic chain or the steps by which bombs or shells are readied. In the close air support field we have air alerts and strip alerts. We choose the weapons we predict will be needed and hang them on the aircraft. If we guess right, we are ready for the emergency; if we guess wrong, it takes a little longer. In the case of artillery, the supported commander picks out what he considers the most dangerous approach into his position as a barrage. The artillery then readies communications, fire direction and ammunition. When not firing another mission, the tubes are laid on that barrage. The signal to fire starts the barrage, which continues until a cease fire is ordered or all ammunition is expended. An avenue of approach is primarily defensive. When a unit jumps off in the attack the commander should ask, and his artillery advisers should insist, that plans be made to move the barrages once, twice or more times to cover the approach, counterattack routes, and reorganization on an objective. Since the same principles are basic to 81mm mortars, the principle of pre-planning and moving a conventional barrage should be widely understood. The principle of achieving the same relative readiness with atomic weapons is no different, except in detail. With artillery, rockets or guided missiles, an atomic barrage can be laid at any time on an avenue of approach, a known enemy target or an objective. Except that atomic barrages need to be placed farther from friendly troops, there is just one difference: the commander must predict the size weapon and height of burst to be placed in high readiness. In the case of air delivery of atomics, several methods actually require a degree of special photography or pilot briefing which correspond to the fire direction requirements of surface means. Accordingly, a strip alert is more appropriate and less expensive.



For fairly obvious reasons, atomic delivery means dislike to disclose their firing positions until the last

moment. This technicality, like strip alert, imposes a small delay. However, the requirement for atomic warning to friendly troops and aircraft also imposes a predictable delay requirement, and the delivery means can, by order or SOP, be allowed just that amount of time to comply with a fire order. In the atomic delivery business, as in any other, things that take a long time to do can be expedited by proper prior planning to get an early start.

The implications of employing an atomic barrage system are not immediately apparent. First, high readiness with atomic weapons will tie up fire direction centers, launchers, aircraft and staffs from conventional use. In an atomic war, this must be accepted. In a conventional war with a high atomic threat, some atomic weapons should be ashore and ready, with a calculated risk taken as to how many delivery means can be allotted for conventional use. In a more limited situation, delivery means might be alerted and positioned according to a full-scale atomic plan, to be implemented only when weapons are logistically delivered to the objective area. This would postulate a calculated risk for time of reaction.

A second problem is that complete readiness cannot be achieved over all objectives, avenues of approach and known targets. Methods to avoid over-commitment include a system of priorities of readiness and the placing of the various delivery means in their highest state of readiness on separate targets.

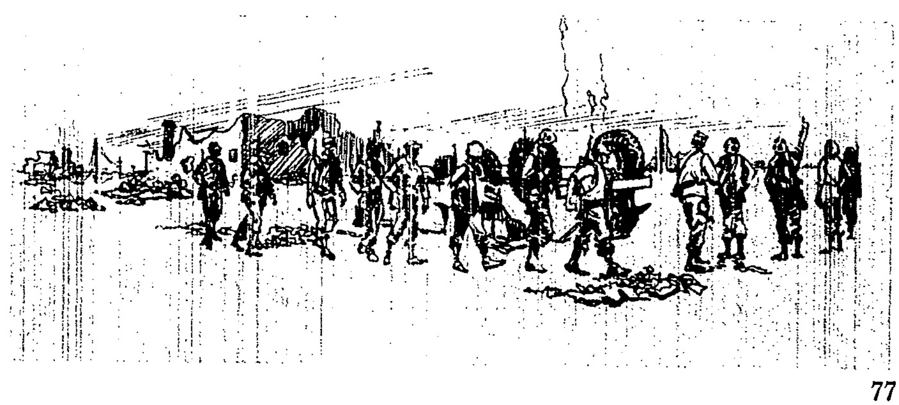
A third problem is that a faulty prediction can assign the wrong readiness priority to targets. One answer to this is to fire now and over-kill or under-kill if the wrong weapon is ready. If the state of readiness is not high enough, we are, at the least, no worse off than we would be if we had no such system. But there is a further answer. Certain delivery means are highly flexible and can deliver any high readiness weapon across the front within range very rapidly.

The final problem of such a system is that of picking a reasonable RGZ for an avenue of approach or objective where no target has yet materialized. The reason this problem exists is that only one or two methods of delivery permit full flexibility with the highest state of readiness that can be attained. Others, as indicated, need guidance as to areas of interest to focus the necessary registration, fire direction, position choice, meteorology, photography or selection of routes and aiming points. The answer here goes back to the artillery principle of "transfer limits." Artillery chooses a base point and registers thereon. It can usually hit that base point if it fires again, even days later, and can come very close to targets within a few thousand yards in any direction. If it shifts out of this immediate area, out of transfer limits, it will not hit nearly so accurately. It so happens that the technical considerations of several key delivery means, artillery, rockets, guided missiles and several air methods, adhere exactly to this principle. One single RGZ, yield, and height of burst must be chosen to get an accurate, high-readiness solution which may take hours to work out. Once that solution is achieved, however, RGZ can be shifted several thousand yards with only a minor loss of time—usually, small enough to be absorbed within the time allowed for final preparation and troop warning.

"If the commander plans ahead . . . he can have atomic fires just as fast as he can possibly use them."

If the commander plans ahead, studies the battlefield and his enemy, and gives realistic guidance to atomic delivery agencies, he can have atomic fires just as fast as he can possibly use them. Actually, the atomic barrage could be delivered as rapidly as the conventional artillery or mortar barrage if troop and aircraft safety would permit.

The final question of the commander is how to get atomic fires. To be candid, this remains an area of confusion, subject to local decision. The question will be explored in detail in a future article on fire support coordination. Suffice it to say that it is now becoming clear that the Assistant S3/G3, Atomic Weapons Employment Officer, has his hands full with the growing, and important, ABC defense role. This includes proper monitoring to insure that otherwise uncoordinated units such as service, engineers and artillery do not violate unit separation and create targets. Were he not so occupied, plus advising the S3/G3 generally on atomic capabilities, he would find it difficult if not impossible to learn the technical capabilities, limitations, and peculiarities of each delivery system. Many Marines can testify with feeling as to the difficulties of learning atomic analysis alone—the art of interpreting what happens when a warhead hits a target, and of determining a suitable RGZ, yield and height of burst. That warhead must still be delivered, and the choice of delivery agency cannot depend on theoretical accuracies



and capabilities. The choice depends on hard facts of actual, practical capabilities in a shifting supporting arms situation. Atomic fires may be a little more than just another supporting arm, but they are delivered by supporting arms weapons systems. Asking the technicians of the FSCC to arrange such technical details removes not one scrap of authority from the commander or from the staff cognizance of G3 who supervises the FSCC. There remains the vital business of determining the scheme of maneuver, the plan of fire support, including priorities, the decision to use atomic weapons, and, above all, the vital business of coordinating the scheme of maneuver and plan of fires. In atomic war, this is far more than an academic consideration.

Also of real concern are the details of what information the analyst *must* be given if he is to do more than guess. At this point it should be clear that "Infantry battalion, coordinates 12345678" is hardly enough for the most hasty template method. Before he can even select a template, the analyst (and the commander) must know: Are the troops in the open or dug in? Are they moving? What is their uniform? How big an area do they cover? He will also want to know, and the asker had best be sure he mentions, the location of the nearest friendlies. Actually, sloppy target descriptions, of which the example is no exaggeration at all, are equally inadequate for the proper attack of a target with any conventional weapon. It is a good thing to have trust and confidence in FOs, SFCPs, and FACs and to go along with their recommended method of attack when we can. However, staffs and commanders responsible for safety and effective use of weapons are entitled to, and need to, know exactly what they are attacking. Accurate target description is a point on which great emphasis must be placed in training. It is hard enough to find targets; it is too much to have them described by would-be strong, silent Western TV heroes.

The atomic weapon is a fact of long standing. We can all hope that it will remain on the shelf. However, until a potential enemy has no capability to use it against us, we must be prepared to use atomic fires. Commanders must be prepared to defend against, and to exploit, its physical and psychological power. In the Navy-Marine air-ground task force we have flexible and varied means that can provide a commander with instantly responsive atomic fires of a wide range of yields. We can lay down barrage-type fires which will completely destroy or thoroughly neutralize targets as no other weapon can. The simple, well-understood principles of conventional supporting arms staff work will serve effectively, provided we properly amplify our intelligence and operations to allow for the added power. Our best insurance against hostile use of atomic weapons, indeed against hostile use of any weapons at all, is so to train as to insure that the Marine air-ground team is prepared to land and fight with helicopter mobility and the big lightning of atomic fires backing the determination and skill of John Rifleman.

US MC

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Gift Wrapped

A CIVILIAN PARKED IN FRONT of the supply building caught the eye of a roving MP. "This is a restricted zone, Mac. Move along."

"But," rejoined the civilian, "this is where they told me at the gate to come pick up a 110-pound package."

"Well, I guess it's okay," said the sentry. "But make it snappy." He walked away.

A lovely young lady who worked in the building came out and got in the car. As the couple sped past the MP, the 110-pound package smiled sweetly and waved.

H. G. Carson

"Just One of Those Days"

IT WAS ONE OF "THOSE" Monday mornings with a half dozen men up to "see the Man" for various minor offenses. The culprits were waiting their turns in the hall outside the Skipper's office. One man had just been marched out and another marched in and stood at attention before the harried Commanding Officer who proceeded to read off the misdeeds listed before him, dress down the young Marine and finally pausing for breath, said, "Well, what do you have to say for yourself?"

"S-S-Sir," stammered the flustered Marine, "I-I-I didn't do anything, I was just standing in the hallway talking to a buddy and the SgtMaj called us to attention, pointed at me, said, 'you're next,' and marched me in."

SgtMaj A. R. Graham

Bottle Discipline

A FORMER COMMANDING GENERAL of the 3dMarDiv was being chided by an Army general following an Army-Marine football game. "General," said the Army man, "you know after the game we found 21 empty spirits bottles under the Marines' stands and only two under the Army's." Without batting an eye, the general turned to his aide and snapped, "Find out who those two Marines were sitting with the Army."

AMSgt. A. G. Mainard